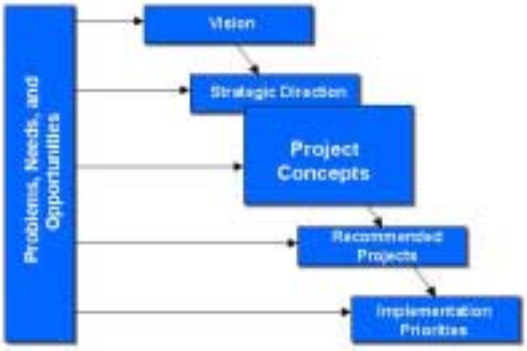
3.4 ITS PROJECT CONCEPTS



3.4.1 ITS Market Packages (or ITS Concepts) – The Strategic Plan Structure

Market Packages are another important component of the National ITS Architecture. Building from the selected User Services and ITS strategic direction, Market Packages bring a deployment-oriented perspective that is tailored to address separately or in combination – real-world transportation problems and needs. The "package" part of the term refers to the fact that market packages typically consist of multiple elements of technology that work together to perform a particular function. The "market" part of the term implies that a consumer market exists for these devices. Market Packages are bundles of technology that the public will buy to improve their travel, either directly in the open market or indirectly through government entities that implement these systems. In addition, Market Packages are a way of defining an ITS concept that can be implemented. They are closely tied to the definition of ITS projects. ITS Projects are more specific than Market Packages, particularly because they specify locations for application, not just the ITS concept. Market Packages provide the connection to the National ITS Architecture and the Central Coast Regional ITS Architecture: its projects relate to how agencies will go about implementing the ITS application → what specifically will be built, where it will be built, and who will be responsible.

The Market Packages are organized into the following general categories:

- Traffic Management and Safety
- Transit Management
- Traveler Information
- Commercial Vehicle Operations
- Advanced Vehicle Safety Systems
- Emergency Management and Enforcement
- Planning

Please refer to Appendix D for a complete listing of these Market Packages. In addition, please refer to the National ITS Architecture CD-ROM for detailed descriptions that explain the Market Packages and flow diagrams that illustrate the functionality that they provide.

The Market Packages deemed appropriate for the Central Coast and the associated projects are indicated in Exhibit 3.2. The exhibit shows the Market Packages, a general time frame for implementation, potential benefits, and appropriate comments pertaining to each Market Package. The Market Package categories as used in the National ITS Architecture are listed in the left column. The bulleted items are subcategories that were developed for the Central Coast. These subcategories relate to the projects that will be discussed in the next section. The decisions on Market Packages to include in the Strategic Plan were based on the problems and issues identified early in the project, a recognition of the general capabilities and costs associated with the Market Packages, and discussions with the Central Coast ITS Steering Committee. As indicated earlier, the ITS Strategic Plan uses an inclusive approach, incorporating Market Packages that may have application in the long-term, as well as those that have higher potential for more immediate application. This allows for the development of a complete Regional ITS Architecture, even though portions may not be implemented for years to come.

The time frames listed in Exhibit 3.2 are listed as short (year 2000 to 2004), medium (2005 to 2009), and long (after 2009). A NR means not relevant to a particular county. These are generalized timeframes, and the actual implementation period will depend on when funding becomes available. Other modifications may also be made to the projects as technology advances and other ideas emerge.

3.4.2 Market Packages and the National ITS Architecture

One of the end results of the ITS Strategic Plan is the development of a Regional ITS Architecture for the Central Coast that the participating agencies can agree to work toward. It is similar to planning and designing a building so that the various systems work together. The design of an architecture does not mean that everything will be done right away. It means that as pieces of the system are put in place, they will build on one another and be able to communicate with one another. Market Packages are not the architecture. They represent ITS applications that should be included in the architecture. Market Packages are the building blocks; the architecture is the set of rules that ties them together. Market Packages cut across travel modes as well as jurisdictional boundaries. The Regional ITS Architecture for the Central Coast is described in Section 4 and further detailed in Volume II.

Exhibit 3.2 – Listing of Recommended Market Packages, ITS Project Concepts, and Deployment Timeframes

(S=Short/<5 Yr., M=Medium/5-10 Yr., L=Long/>10 Yr., NR=Not Relevant to a Particular County; Sbt=San Benito, Scr=Santa Cruz, Mon=Monterey, SLO=San Luis Obispo, SB=Santa Barbara)

	Deployment Timeframe							
Market Package/ITS Project Concept	Region	SBt	SCr	Mon	SLO	SB	Potential Benefits	Comments
Traffic Management and Safety								
Network Surveillance							Enables control and info functions	
• Roadway sensors	S	M	S	S	S-M	S	Congestion monitoring and incident response	Freeway and arterial
• Closed Circuit TV	S	L	S	S-M	M	S		Freeway and arterial
• Smart call boxes	S	M	S	S	S-M	S	Better data in selected locations	Extends use of existing call boxes
Surface Street Control							Improved speeds, fewer stops	
• Basic synchronization	S	S	S	S	S	S	Same as above plus better mgmt. of system overall	Highly effective use of funds
• Central control	S-L	NR	S	M	M	S		For larger cities in Central Coast
Freeway Control								
• Ramp metering	S	L	S	L	M-L	S	Better use of freeway, safer merging	Need to plan with cities
HOV Lane Management	M-L	NR	L	NR	NR	L	More automated control of lanes	Only as HOV implemented
Traffic Info. Dissemination							Quick, effective display of info to public	
• Changeable message signs	S	M	S	S	S	S	Good for construction areas/events	Quality of info is key
• Highway advisory radio	S	M	S	S	M	S	Flexible, cost-effective method to address emergencies, special events, etc.	
• Portable traffic management system	S	S	S	S	S	S		
Regional Traffic Control							Reduced congestion at interchanges	
• Integrated fwy/art control	M-L	L	M-L	M-L	L	M	Better inter-jurisdictional coord./response	Need state/local MOUs
• Regional Transportation Mgmt. Center	S-M	S-M	S-M	S-M	S-M	S-M		
Incident Management System								
• CAD system enhancements	M	M	M	M	M	M	Better interagency coord/response	
• Motorist aid systems (i.e. call boxes)	S	S	S	S	S	S	Assistance to stranded motorists	Funding is local option
• Response strategy support	S	S	S	S	M	S	Rapid clearance, reduced delay	
Emissions Monitoring and Management								
• Pollution level monitoring	S-M	NR	M	S-M	M-L	S	Automation of smog alerts	
• Vehicle emissions monitor/spot locations	M	NR	M	M	M-L	M	Enforcement of emission reqts	Need to tie to policy

Exhibit 3.2 – Listing of Recommended Market Packages, ITS Project Concepts, and Deployment Timeframes

(S=Short/<5 Yr., M=Medium/5-10 Yr., L=Long/>10 Yr., NR=Not Relevant to a Particular County; Sbt=San Benito, Scr=Santa Cruz, Mon=Monterey, SLO=San Luis Obispo, SB=Santa Barbara)

	Deployment Timeframe							
Market Package/ITS Project Concept	Region	SBt	SCr	Mon	SLO	SB	Potential Benefits	Comments
Standard Railroad Grade Crossing	S	S	S	S	S	S	Standard safety warning systems	
Advanced Railroad Grade Crossing	M	M	M	M	S-M	M	Improved warning/protection	
Parking Facility. Mgmt. • Pkg. usage monitoring • Electronic parking fees	 M-L S-L	 NR NR	 L L	 M-L M-L	 M-L S-M	 S-M M	 Reduced delay Improved efficiency	Use in garages with frequent overflow In govt. run lots/garages
Road Weather Information System • Weather info dissem.	 S-M	 M	 S-M	 S-M	 M	 M	 More effective info to public	
Advanced safety systems • Advanced crosswalk • Curve/grade warning • Height detectors	 M M M	 NR M NR	 M M M	 M M M	 S-M M M	 M M M	 Improved pedestrian/bicycle safety Increases level of awareness Better info for truckers	
Transit Management								
Transit Vehicle Tracking	S-M	NR	S-M	S-M	S-M	S-M	Improves operation, sched. adherence	
Transit Fixed-Route Ops. • Off-line route/schedule management	 S-M	 NR	 S-M	 S-M	 S-M	 S	 Improves internal operations	
Demand Response Transit Operations • Automated dispatching/information	 S	 M	 S	 S	 S-M	 S	 Reduces demands on dispatchers	
Transit Passenger and Fare Management • Automated passenger counting • Electronic fare collection	 S-M S-M	 NR NR	 S S	 S S	 S-M S-M	 S S	 Better info for route planning Faster boarding, less cash mgmt.	
Transit Security • Video surveillance • Voice/data communications	 M S	 NR S	 M S	 M S	 M-L M-L	 L L	 Improved passenger/driver security Improved pass/driver security	Only where security is a problem

Exhibit 3.2 – Listing of Recommended Market Packages, ITS Project Concepts, and Deployment Timeframes

(S=Short/<5 Yr., M=Medium/5-10 Yr., L=Long/>10 Yr., NR=Not Relevant to a Particular County; Sbt=San Benito, Scr=Santa Cruz, Mon=Monterey, SLO=San Luis Obispo, SB=Santa Barbara)

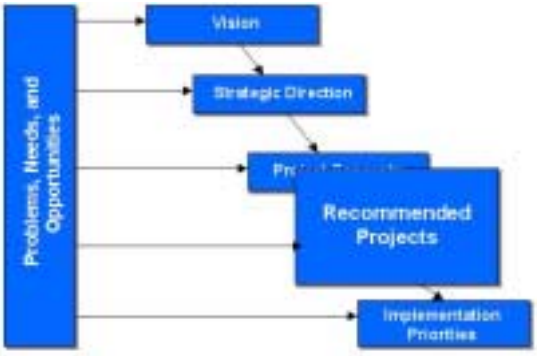
	Deployment Timeframe							
Market Package/ITS Project Concept	Region	SBt	SCr	Mon	SLO	SB	Potential Benefits	Comments
Transit Maintenance								
• Maintenance sched.	S-M	NR	S	S	M-L	S	Improved in-service percentage	
• On-board diagnostics	S-M	NR	S	S	M-L	S	Improved in-service percentage	Bus purchase option
Multi-Modal Coordination								On heavier routes and must not degrade flow
• Signal priority	M	NR	M	M	M	M	Improved schedule adherence	
Transit Traveler Information								
• Itinerary info. services	S	M	S	S	S	S	Personalized route planning	Can add features incrementally
• Static transit sched info	S	M	S	S	M	S	Basic info automated	
• Real-time schedule info	M	NR	M	M	S	M	Improved passenger info	
Traveler Information								
Broadcast Traveler Info.								Private systems are just starting to be deployed
• Pager- and cellular-based systems	M	L	M	M	M	M	Targeted info to subscribers	
• Radio-based systems	S	L	S	S	M	S	Traffic info to wide audience	All info systems must maintain info quality
Interactive Traveler Info.							Provides easy/immediate info access	
• Telephone-based	S	L	S	S	S	S	Provides info at spot locations	
• Kiosk-based	M	L	M	M	M	M	Info to users with PCs and mobile Web devices	Need to be selective
• Internet-based	S	S	S	S	S	S		
Yellow Pages and Reservation	S	M	S	S	S	S	Basic info to travelers on services	
Commercial Vehicle Operations								
Electronic Clearance	S	NR	S	S	S	S	Less delay, more efficient	State responsibility
CV Administrative Processes	S	NR	S	S	S	S	Less delay, more efficient	State responsibility
International Border Electronic Clearance	NR	NR	NR	NR	NR	NR	Not applicable in Central Coast	
Weigh-In-Motion	S	NR	S	S	NR	S	Less delay	State responsibility
Roadside CVO Safety	M	M	M	M	M	M	Reduced accidents	

Exhibit 3.2 – Listing of Recommended Market Packages, ITS Project Concepts, and Deployment Timeframes

(S=Short/<5 Yr., M=Medium/5-10 Yr., L=Long/>10 Yr., NR=Not Relevant to a Particular County; Sbt=San Benito, Scr=Santa Cruz, Mon=Monterey, SLO=San Luis Obispo, SB=Santa Barbara)

	Deployment Timeframe							
Market Package/ITS Project Concept	Region	SBt	SCr	Mon	SLO	SB	Potential Benefits	Comments
HazMat Management	S-M	M	S-M	S-M	M	S-M	Improved safety	State responsibility
Other - Automatic dispatch/info.				S-M			Assist with truck staging areas, congestion	
Emergency Management and Enforcement								
Emergency Response • Emerg veh. tracking • Enhanced CAD sys.	 S S-M	 M M	 S S-M	 S S-M	 M L	 S S	 Improved service, response times Improved emergency response	
Emergency Routing • Signal pre-emption for emergency veh. • Route guidance	 S M	 M L	 S M	 S M	 S M	 S M	 Improved response times Improved response times	
Mayday Support • Mayday notification • Mayday response ctr.	 S-M S-M	 M M	 M M	 S S	 S S	 M M	 Improved response times Improved response times	CHP Dispatch Centers in Monterey and San Luis Obispo are currently mobilizing resources Private sector is currently deploying systems
Enforcement Systems • Red light enforcement technologies • Stop sign enforcement technologies • Neighborhood speed monitoring technologies	 M M S	 M M M	 M M S	 M M S	 L L M	 M M S	 Better traffic discipline/safety Better traffic discipline/safety Safer neighborhood streets	Should be implemented selectively to address known problems
Planning								
• Planning Data Collection	S	S	S	S	S	S	More efficient, comprehensive data collection	Need to plan in conjunction with other ITS projects

3.5 RECOMMENDED ITS PROJECTS



3.5.1 Project Definition

A series of candidate ITS projects was developed based on the identified problems, the market package priorities, and the existing ITS infrastructure. By "projects" we mean specific ITS Market Packages or Market Package subcategories (see Exhibit 3.2) that are tied to at least general locations. They may also be tied to systems, such as transit operators (fixed route or demand responsive), emergency services, etc. The projects are not necessarily grouped in a way that would be appropriate for design and procurement. In some cases, it may be appropriate for multiple projects to be designed and procured together under one solicitation. In other cases, the projects may need to be split further and provided with greater detail than could be developed in this Strategic Plan.

Appendix E provides a full listing of the ITS projects developed in the Strategic Plan process. It presents a table that indicates project locations, plus a more detailed description of the various projects. Section 4 describes how these projects are accommodated within the Central Coast Regional ITS Architecture. It is expected that this list of projects will be expanded or modified over time as new ideas are generated and as technology changes, offering opportunities that had not been anticipated. These additional projects or modifications need to be tied to the overall Regional ITS Architecture. The Strategic Plan should be modified periodically to reflect these updates, but there is no requirement for the project to be in the ITS Strategic Plan before it can be programmed. However, the project will require a determination of conformance with the National ITS Architecture in order to receive federal funds.

Exhibit 3.3 indicates generic location information for the various projects. The location specification is tailored to the type of project. In some cases the location is associated with various streets. In others, it is associated with cities or systems (e.g. transit or emergency service agencies). The projects and their locations can be defined in greater detail as funding is identified and as they are included in state and local programs. These locations are spelled out in greater detail in Appendix E.

Exhibit 3.3 - Recommended Central Coast ITS Project Locations

Central Coast ITS Project	Generalized Project Locations
Traffic Management and Safety	
Network Surveillance • Closed Circuit TV • Surveillance stations • Smart call boxes	At ramp meter locations and selected mainline freeway sections as congestion warrants On freeway ramps and selected mainline sections as congestion warrants Selected locations where planning data or monitoring data are desired
Surface Street Control • Basic Synchronization • Central Control	Selected arterial locations identified by local governments Cities of Santa Barbara, Santa Maria, San Luis Obispo, Monterey, Salinas, and Santa Cruz
Freeway Control • Ramp metering	At on-ramps in congested sections as warranted
HOV Lane Management • High Occupancy Toll (HOT) Lanes	SR 1 in Santa Cruz County From junction with SR 17, HOT lanes will run south for approx. 6 miles
Traffic Information Dissemination • Changeable message signs • Highway advisory radio • Portable Traffic Mgmt. System	At major route decision points as identified in Appendix E At points where additional information needed, such as adverse weather-prone areas One or two units per county for use at special events or construction
Regional Traffic Control • Regional Fwy/Art. Control • Regional Trans. Mgmt. Ctr.	Freeways in Santa Barbara, Santa Maria, Monterey Peninsula Cities, and Santa Cruz Jointly operated by Caltrans and CHP at a mutually-agreeable location
Incident Management System • CAD System Enhancements • Integrated Comm. System • Call boxes • Response Strategy Support	Emergency response agencies, as they can afford upgrades Support enhancements and upgrades to CHP and emergency response agency radio systems Along all state highways Upgrades implemented by individual agencies over time
Emission Monitoring and Mgmt.	No specific projects proposed
Standard RR Grade Crossing	Rural locations without current protection
Advanced RR Grade Crossing	Rural and urban locations with highest vehicle-train accident rate
Parking Facility Management • Parking usage monitoring • Electronic parking fees	Santa Barbara downtown, waterfront, and mission area, downtown's of SLO, Monterey, Carmel, and Santa Cruz, Monterey Aquarium, selected special event centers Same as above plus Monterey Fisherman's Wharf and Santa Cruz Boardwalk
Road Weather Info System	US 101 Ventura to Buellton, SR 154, SR 1 Big Sur area, US 101 through Prunedale, SR 1 and SR 17
Advanced Safety Systems • Advanced crosswalks • Curve/grade warning system • Height detectors	Around universities, central business districts, and other selected locations with identified pedestrian safety issues Experimental – possible applications to be determined through Caltrans safety program No specific projects proposed

Exhibit 3.3 - Recommended Central Coast ITS Project Locations

Central Coast ITS Project	Generalized Project Locations
Transit Management	
Transit Vehicle Tracking	All transit agencies, phased in over time
Transit Fixed Route Operations • Off-line route/sched. Mgmt.	All transit agencies, phased in over time
Demand/Response Transit Ops • Automated dispatching/info	Transit agencies providing dial-a-ride service
Transit Passenger and Fare Mgmt • Automated passenger counting • Electronic fare collection	All fixed route operators All fixed route operators
Transit Security • Video surveillance • Voice/data communications	Possibly all operators, but medium- to long-term Possibly all operators, but medium- to long-term
Transit Maintenance	All operators as technology becomes affordable
Multi-modal Coordination • Signal priority	State Street in Santa Barbara, selected arterials in SLO, Abrego Street in Monterey, Ocean Ave. in Santa Cruz
Transit Traveler Information • Static route/schedule info • Real-time schedule info	All fixed route operators SBMTD, CCAT, SLO Transit, MST, and SCMTD Arrival information at AMTRAK stations, especially unmanned stations
Traveler Information	
Broadcast Traveler Information	Information service providers (ISPs) implement systems as market dictates For this and "Interactive Traveler Information," CHP, Caltrans, and other agencies can facilitate the collection and distribution of information
Interactive Traveler Information	Traffic info made available through Internet, kiosks tied to Internet, ISPs, telephone call-in systems, and private sector implementations
Yellow Pages and Reservation	Region wide by tourism agencies and private sector
Commercial Vehicle Operations	
Electronic Clearance	At weigh station/inspection locations
CV Administrative Processes	State issue, not implemented locally
Weigh-in-Motion	At weigh station/inspection locations
Roadside CVO Safety	At weigh station/inspection locations
HazMat Management	Tie into state or national system when available
Automated Dispatch Info System	Salinas
Emergency Management and Enforcement	
Emergency Response	Individual law enforcement and emergency service providers In addition, government agencies could encourage improved cellular coverage to allow faster incident reporting and greater coverage for mayday systems
Emergency Routing • Signal pre-emption • Route guidance	State Street in Santa Barbara, Higuera Ave. SR 1, & SR 227 in SLO, Grand Ave. in Arroyo Grande, El Camino Real in Atascadero, Abrego St. in Monterey, Ocean Ave. in Santa Cruz Individual law enforcement and other emergency service agencies

Exhibit 3.3 - Recommended Central Coast ITS Project Locations

Central Coast ITS Project	Generalized Project Locations
Mayday Support	Implemented through private call centers with information forwarded to CHP and other public safety answering points (PSAPs) For the transfer of information by voice, training and procedures are necessary for PSAPs; for data transfer, additional PSAP equipment may be necessary
Enforcement Systems	Designated safety corridors and other areas of high accident potential
Planning	
Planning Data Collection	Data archiving system at RTPAs and Caltrans

It should be noted that a regional Transportation Management Center (TMC) is a cornerstone of the ITS Strategic Plan for the Central Coast. The TMC is expected to be a focal point of information flow and decision-making for traffic management, public safety, and emergency management. A separate section is devoted to discussion of the TMC.

Exhibit 3.4 provides an example of more specific location information that defines projects that would implement Closed Circuit TV on freeways or other selected roadways. The Caltrans District 5 10-Year ITS Plan indicates that CCTV would be installed on every on-ramp with ramp metering so that the metering operation could be monitored. In addition, other mainline locations would be equipped with CCTV, as shown on a county-by-county basis. These would be packaged together or split, as appropriate, into procurement packages that could be constructed. In all likelihood, the CCTV would be packaged together with other Market Package elements such as surveillance stations and ramp metering. The approach to this would be determined as funding is identified and projects are programmed.

*Exhibit 3.4. Example Project Locations for Closed Circuit Television (CCTV)**

Region	CCTV Location
Santa Barbara County	• US 101 – SR 150/Ventura County line to Hollister Ave. (Santa Barbara Area) • US 101 – Clark Ave to San Luis Obispo County Line (Santa Maria Area)
San Luis Obispo County	• US 101 – Cuesta Grade (San Luis Obispo to SR 58) • US 101 – SR 166/Santa Barbara County line to Los Berros (Nipomo Area) • US 101 – El Campo to Lower Higuera (Five Cities Area) • US 101 – Los Osos Valley Rd. to Monterey St. (San Luis Obispo Area) • US 101 – SR 58 to Santa Cruz Rd. (Santa Margarita/Atascadero Area) • US 101 – Vineyard to SR 46 east (Templeton/Paso Robles Area)
San Benito County	• US 101 – Monterey County line to 7.5 miles north
Monterey County	• US 101 – around SR 156 junction • US 101 – Airport Blvd. To Boronda (Salinas Area) • US 101 – Russell Rd/Espinosa Rd. to Crazy Horse Rd. (Prunedale Area) • SR 68 from SR 1 to Salinas • SR 56 from SR 1 to US 101 • SR 1 – SR 68 (south) to Reservation Rd. (Monterey Peninsula)
Santa Cruz County	• SR 17 – SR 1/SR 17 Junction to Santa Clara County Line • SR 1 – Freedom Blvd. O.C. to SR 1/SR 17 Junction

* CCTV will be included as part of all future ramp meter installations (Caltrans District 5 10-Year ITS Plan)

3.5.2 Groups that Stand to Benefit from ITS Projects

Exhibit 3.5 indicates the groups that stand to benefit from the various projects. The "X's" indicate the primary beneficiaries, not necessarily those groups who benefit in secondary or indirect ways. Information on potential benefits is amplified in Appendix E. Exhibit 3.5 indicates that the ITS projects touch a broad constituency. The most direct beneficiaries are the groups that actually do the travelling or the shipping of goods. However, there are a variety of benefits to other groups. For example, improved travel times benefit the business community in reducing their cost of travel. In the case of companies in the distribution business, this could even mean reduction in their vehicle fleet and the cost of labor, making them more competitive nationally. General citizens (i.e. when they are not traveling) benefit from improvements in air quality and security.

Exhibit 3.5 - Groups that Stand to Benefit from Central Coast ITS Projects

Central Coast ITS Project	Auto Travelers	Transit Riders	Trucking Companies	Local Agencies	Caltrans	CHP	Transit Agencies	Citizens in General	Business Community	Event Managers
Traffic Management and Safety										
Network Surveillance										
• CCTV	X		X	X	X	X	X	X	X	X
• Surveillance stations	X		X	X	X	X	X	X	X	X
• Smart call boxes	X		X	X	X	X				
Surface Street Control										
• Basic Synchronization	X	X	X	X	X		X	X		
• Central Control	X	X	X	X	X		X			
Freeway Control										
• Ramp metering	X		X		X	X				
HOV Lane Management										
• High Occupancy Toll (HOT) Lanes	X			X	X	X		X		
Traffic Information Dissemination										
• Changeable message signs	X	X	X	X	X	X		X		X
• Highway advisory radio	X	X	X	X	X	X		X		X
• Portable Traffic Mgmt. System	X	X	X	X	X	X		X		X
Regional Traffic Control										
• Regional Fwy/Art. Control	X	X		X	X	X				X
• Regional Trans. Mgmt. Ctr.	X	X	X	X	X	X	X	X	X	X
Incident Management System										
• CAD System Enhancements	X	X	X	X	X	X	X			
• Integrated Comm. System	X	X	X	X	X	X	X			
• Call boxes	X		X	X	X	X		X		
• Response Strategy Support	X		X	X	X	X				
Emission Monitoring and Mgmt.					X		X	X	X	
Standard RR Grade Crossing	X		X	X	X	X	X	X		
Advanced RR Grade Crossing	X		X	X	X	X	X	X		
Parking Facility Management										
• Parking usage monitoring				X					X	X
• Electronic parking fees	X			X					X	X
Road Weather Info System	X		X	X	X	X	X	X		
Advanced Safety Systems										
• Advanced crosswalks				X	X	X	X	X		
• Curve/grade warning system	X		X	X	X	X	X	X		
• Height detectors			X	X	X	X				
Transit Management										
Transit Vehicle Tracking		X					X			
Transit Fixed Route Operations										
• Off-line route/sched. Mgmt.		X					X			

Exhibit 3.5 - Groups that Stand to Benefit from Central Coast ITS Projects

Central Coast ITS Project	Auto Travelers	Transit Riders	Trucking Companies	Local Agencies	Caltrans	CHP	Transit Agencies	Citizens in General	Business Community	Event Managers
Demand/Response Transit Ops										
• Automated dispatching/info		X					X	X		
Transit Passenger and Fare Mgmt										
• APC		X					X	X		
• Electronic fare collection		X					X	X		
Transit Security										
• Video surveillance		X					X	X		
• Voice/data communications		X					X	X		
Transit Maintenance		X					X			
Multi-modal Coordination										
• Signal priority		X					X	X		
Transit Traveler Information										
• Static route/schedule info		X					X	X		
• Real-time schedule info		X					X	X		
Traveler Information										
Broadcast Traveler Information	X	X	X	X	X	X	X	X	X	X
Interactive Traveler Information	X	X	X	X	X	X	X	X	X	X
Yellow Pages and Reservation	X	X	X	X			X	X	X	X
Commercial Vehicle Operations										
Electronic Clearance			X		X	X			X	
CV Administrative Processes			X		X	X			X	
Weigh-in-Motion			X		X	X				
Roadside CVO Safety			X		X	X			X	
HazMat Management			X			X				
Automated Dispatch Info System			X	X					X	
Emergency Management and Enforcement										
Emergency Response	X	X	X	X	X	X	X	X	X	X
Emergency Routing										
• Signal pre-emption				X		X				
• Route guidance				X		X				
Mayday Support	X					X		X		
Enforcement				X		X				
Planning										
Planning Data Collection				X	X		X			X